Chapter 6
Conclusion

From the presented work, it is concluded that neural networks can be very powerful models for the classification of speech signals. Some types of very simplified models can recognize the small set of words. The performance of the neural networks is being impacted largely by the pre-processing technique. Although none of the approaches proved to be good enough for practical purposes with the present extent of development, they were good enough to prove that translating speech into trajectories in a feature space works for recognition purposes. The human speech is an inherently dynamical process that can be properly described as a trajectory in a certain feature space. Even more, the dimensionality reduction scheme proved to reduce the dimensionality while preserving some of the original topology of the trajectories, i.e. it preserved enough information to allow good recognition accuracy. It is interesting to note that despite the fact that the SOM (Self Organizing Map) has been used in the speech recognition field for more than a decade, nobody has used it to produce trajectories, but only to generate sequences of labels. Finally, the new approach developed for training the neural network's architecture proved to be simple and very efficient. It reduced considerably the amount of calculations needed finding the correct set of parameters. If the traditional approach had been used instead, the amount of calculations would have been higher. Also the fact is neural networks has proved to be very useful for various applications. It can be used for industrial as well as home automation applications. Finally by using speech recognition system is very handy for controlling devices.